

In the Claims

Kindly cancel claims 1-80 as indicated in the following listing of all the claims in the application.

1-80 (canceled)

81. (previously presented) A method of supporting workpieces, lower surfaces of ones of which have features of different heights, the method comprising the steps of: providing a tooling fixture, comprising a body including a plurality of cylinder bores, at least one support fluid manifold fluidly connected to the cylinder bores, and a surface over which a workpiece is in use supported, a plurality of supporting elements for supporting the workpiece, the supporting elements being slideably disposed in respective ones of the cylinder bores, and at least one support fluid reservoir containing support fluid and operably fluidly connected to the at least one support fluid manifold; displacing support fluid between the at least one support fluid reservoir and the at least one support fluid manifold such that the supporting elements adopt a supporting position in conforming contact with a lower surface of the workpiece, with at least ones of the supporting elements being moved such that at least ones of the supporting elements, from a position not in conforming contact with the lower surface of the workpiece, assume the supporting position in conforming contact with the lower surface of the workpiece in which ones of the supporting elements assume different heights from others of the supporting elements in conformance with features on the lower surface of the workpiece; and locking the supporting elements when in the supporting position.

82. (previously presented) The method of claim 81, wherein the support fluid displacement step comprises the step of: displacing support fluid from the at least one support fluid reservoir to the at least one support fluid manifold such that the supporting elements are extended to adopt the supporting position in conforming contact with the workpiece, with at least ones of the supporting elements being raised to different heights in conformance with features on the lower surface of the workpiece.

83. (previously presented) The method of claim 81, wherein the support fluid displacement step comprises the steps of:

displacing support fluid from the at least one support fluid reservoir to the at least one support fluid manifold such that the supporting elements are extended to an extended position; and

subsequently allowing displacement of support fluid from the at least one support fluid manifold to the at least one support fluid reservoir such that at least ones of the supporting elements are lowered to adopt the supporting position in conforming contact with the workpiece, with at least ones of the supporting elements being lowered to different heights in conformance with features on the lower surface of the workpiece.

84. (previously presented) The method of claim 81, wherein displacement of support fluid from the at least one support fluid reservoir to the at least one support fluid manifold to extend the supporting elements is effected by application of a positive pneumatic pressure to the at least one support fluid reservoir.
85. (previously presented) The method of claim 84, wherein displacement of support fluid from the at least one support fluid manifold to the at least one support fluid reservoir to retract the supporting elements is effected by application of a vacuum to the at least one support fluid reservoir.
86. (previously presented) The method of claim 84, wherein the positive pneumatic pressure exerts a predeterminable pressure to the support fluid corresponding to a force to be exerted by the supporting elements on the workpiece.
87. (previously presented) The method of claim 81, wherein the tooling fixture further comprises at least one drive piston assembly comprising a support fluid drive piston slideably disposed in the respective at least one support fluid reservoir.
88. (previously presented) The method of claim 87, wherein the support fluid drive piston comprises a floating piston.

89. (previously presented) The method of claim 88, wherein displacement of support fluid from the respective at least one support fluid reservoir to the at least one support fluid manifold to extend the supporting elements is effected by application of a positive pressure to the respective at least one support fluid reservoir at a location, with respect to the support fluid drive piston, opposite the fluid connection between the respective at least one support fluid reservoir and the at least one support fluid manifold.
90. (previously presented) The method of claim 89, wherein the positive pressure comprises a pneumatic pressure.
91. (previously presented) The method of claim 89, wherein displacement of support fluid from the at least one support fluid manifold to the respective at least one support fluid reservoir to retract the supporting elements is effected by application of a negative pressure to the respective at least one support fluid reservoir at a location, with respect to the support fluid drive piston, opposite the fluid connection between the respective at least one support fluid reservoir and the at least one support fluid manifold.
92. (previously presented) The method of claim 91, wherein the negative pressure comprises a vacuum.
93. (previously presented) The method of claim 87, wherein displacement of support fluid between the respective at least one support fluid manifold and the respective at least one support fluid reservoir is effected by operation of a hydraulic cylinder connected to the support fluid drive piston via a connecting rod such as to drive the connecting rod selectively in a first direction to displace support fluid from the respective at least one support fluid reservoir to the respective at least one support fluid manifold to extend the supporting elements, and a second, opposite direction to displace support fluid from the respective at least one support fluid manifold to the respective at least one support fluid reservoir to retract the supporting elements.

94. (previously presented) The method of claim 87, wherein displacement of support fluid between the respective at least one support fluid manifold and the respective at least one support fluid reservoir is effected by operation of a pneumatic cylinder connected to the support fluid drive piston via a connecting rod such as to drive the connecting rod selectively in a first direction to displace support fluid from the respective at least one support fluid reservoir to the respective at least one support fluid manifold to extend the supporting elements, and a second, opposite direction to displace support fluid from the respective at least one support fluid manifold to the respective at least one support fluid reservoir to retract the supporting elements.
95. (previously presented) The method of claim 87, wherein the drive piston assembly is operative to exert a predetermined pressure to the support fluid corresponding to a force to be exerted by the supporting elements on the workpiece.
96. (previously presented) The method of claim 81, wherein the tooling fixture further comprises at least one valve unit fluidly connecting at least one of the at least one support fluid reservoir and at least one of the at least one support fluid manifold.
97. (previously presented) The method of claim 81, wherein the body includes a plurality of rows of cylinder bores and one support fluid manifold fluidly connected thereto.
98. (previously presented) The method of claim 81, wherein the body includes a plurality of rows of cylinder bores and a plurality of support fluid manifolds each fluidly connected to a plurality of the rows of cylinder bores.
99. (previously presented) The method of claim 81, wherein the body includes a plurality of rows of cylinder bores and a plurality of support fluid manifolds each fluidly connected to a respective one of the rows of cylinder bores.

100. (previously presented) The method of claim 97, wherein the tooling fixture further comprises one support fluid reservoir operably fluidly connected to the one support fluid manifold.
101. (previously presented) The method of claim 98, wherein the tooling fixture further comprises one support fluid reservoir operably fluidly connected to the support fluid manifolds.
102. (previously presented) The method of claim 98, wherein the tooling fixture further comprises a plurality of support fluid reservoirs each fluidly connected to a respective one of the support fluid manifolds.
103. (previously presented) The method of claim 99, wherein the tooling fixture further comprises one support fluid reservoir operably fluidly connected to the support fluid manifolds.
104. (previously presented) The method of claim 99, wherein the tooling fixture further comprises a plurality of support fluid reservoirs each fluidly connected to a respective one of the support fluid manifolds.
105. (previously presented) The method of claim 100, wherein the tooling fixture comprises one valve unit operably fluidly connecting the one support fluid reservoir and the one support fluid manifold.
106. (previously presented) The method of claim 101, wherein the tooling fixture comprises one valve unit operably fluidly connecting the one support fluid reservoir and each support fluid manifold.

107. (previously presented) The method of claim 101, wherein the tooling fixture comprises a plurality of valve units each operably fluidly connecting the one support fluid reservoir to a respective one of the support fluid manifolds.
108. (previously presented) The method of claim 102, wherein the tooling fixture comprises a plurality of valve units each operably fluidly connecting respective ones of the support fluid reservoirs and the support fluid manifolds.
109. (previously presented) The method of claim 103, wherein the tooling fixture comprises a plurality of valve units each operably fluidly connecting the one support fluid reservoir to a respective one of the support fluid manifolds.
110. (previously presented) The method of claim 104, wherein the tooling fixture comprises a plurality of valve units each operably fluidly connecting respective ones of the support fluid reservoirs and the support fluid manifolds.
111. (previously presented) The method of claim 96, wherein the or each valve unit comprises a pressure-sensitive shut-off valve which automatically closes and prevents displacement of support fluid between the respective at least one fluid support reservoir and the respective at least one fluid support manifold when the pressure exerted by the support fluid exceeds a predetermined value.
112. (previously presented) The method of claim 96, wherein the or each valve unit includes a valve fluidly connecting the respective at least one support fluid reservoir and the respective at least one support fluid manifold for controlling flow of support fluid therebetween, and the tooling fixture further comprises a pressure sensor fluidly connected to the at least one support fluid manifold for detecting the pressure exerted by the support fluid, and a controller operably fluidly connected to the pressure sensor and the valve, with the valve being closed when the pressure exerted by the support fluid exceeds a predetermined value.

113. (previously presented) The method of claim 96, wherein the or each valve unit includes first and second valves disposed in parallel combination and operably fluidly connecting the respective at least one fluid support reservoir and the respective at least one fluid support manifold, the first valve being a one-way check valve which allows for flow of support fluid from the respective at least one support fluid reservoir to the respective at least one support fluid manifold and the second valve being operable to fluidly connect the respective at least one support fluid manifold to the respective at least one support fluid reservoir in allowing flow of support fluid from the respective at least one support fluid manifold to the respective at least one support fluid reservoir.
114. (previously presented) The method of claim 81, wherein the body includes at least one return fluid manifold fluidly connecting the cylinder bores, the cylinder bores being fluidly connected at one end to the respective at least one supply fluid manifold and at another end to the respective at least one return fluid manifold, and displacement of support fluid from at least one of the at least one supply fluid manifold to return the supporting elements to a retracted position is effected by application of a positive pressure to at least one of the at least one return fluid manifold.

CONCLUSION

Applicants respectfully ask that the above resubmitted section be merged with the prior filed response and amendments prior to re-examination and reconsideration.

Should the Instruments Examiner have any questions or believe a personal or telephonic interview may be in order, he is invited to contact the undersigned at his earliest convenience.

Respectfully submitted,

REED SMITH LLP

By:


Mark R. Shanks
Reg. No. 33,781

Date: 10/22/04
1301 K Street
Suite 1100 East Tower
Washington, D.C. 20005
202.414.9204
Fax 202.414.9299